

A study on prevalence, risk factors and economic impact of sheep pox in North and South Kordofan States of the Sudan

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The current study is an attempt to better understand the epidemiology of sheep pox in the Kordofan region in the western part of the Sudan, which is one of the largest production sites for sheep. The study was designed as a cross-sectional survey in the Kordofan region, with collection of specimen from the target population of sheep from March to September 2011; a concurrent questionnaire was done. The current study revealed that the estimated overall sero-prevalence of SPP in Kordofan region was 20.1% and that SPP prevails both in SKS and in NKS. Also, a number of risk factors like locality, herd size, insect bites and rain fall/year and traditional treatment were found to be significantly associated with SPP occurrence in the Kordofan region. The average cost of SPP was estimated at 20.5% of sheep flock production costs. The Indirect ELISA test to detect antibodies to capripox viruses was evaluated to have a diagnostic sensitivity of 33.33% and a diagnostic specificity of 60%.

A spatial zero-inflated modelling approach for assessing the H5N1 surveillance system in Thailand

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In Thailand, the major epidemic lasted from July 2004 to May 2005. The H5N1 surveillance system has often been assumed to be very efficient during this epidemic. However, no quantitative assessment of the Thai H5N1 surveillance program has been so far undertaken. Here, we propose to use zero-inflated (ZI) models to analyze unilist capture-recapture surveillance data collected during the 2004 epidemic at subdistrict level, to identify the factors driving the presence/absence of the disease and those influencing the detection process. ZI models use the number of detections of infection in the different sites for estimating the total number of infected sites, including those where infection was never detected. We considered each subdistrict of the country as the epidemiological unit (site), and that each H5N1 outbreak notified during the 2004 epidemic constituted a detection of the disease in the site. Therefore, our count dataset focused on the number of detected outbreaks in each subdistrict. To derive the real number of infected sub-districts, we fitted a ZI Poisson model (ZIP) and a ZI negative binomial model (ZINB) to our dataset. We tested the residuals for spatial autocorrelation, proved it was significant and thus added a spatial autocorrelation term in the model. As expected, the spatial ZINB fitted the data better than the spatial ZIP, suggesting the presence of overdispersion in the counts of detections. Derived from the spatial ZINB model, we were able to estimate the real number of infected subdistricts during the epidemic and the sensitivity of detection at sub-district level. We also identified the most important factors that determine the presence/absence of the disease in subdistricts (density of human population and density of free grazing ducks), and influence the detection process (density of free grazing ducks and density of native chicken).